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Environmental waterproofing solutions

Fatra Modular Membranes

Membranes for Temporary, Mid-term & Long-term waterproofing

Fatra Modular Membranes

Membranes for Temporary, Mid-term & Long-term waterproofing

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Fatra Modular Membranes

1) Modular Membranes Information

Introduction

Fatra UK Ltd was formed over 20 years ago and has been involved in many noteworthy and high profile projects. The company has continued to expand and now offers one of the most comprehensive packages available in the industry, including a range of high quality components backed by design services, costing advice, field support and training.

Technical support

Fatra's design services include specifications, wind load calculation and thermal calculations. Additionally, crucial issues such as environmental impact and acoustics can also be addressed using Fatra's extensive experience in these areas.

As well as an ever expanding library of standard details, Fatra's in-house CAD services provide project specific details where required. All the services are backed by our Professional Indemnity insurance.

Modular membranes

Fatra have been supplying roof blankets into the modular building industry for a number of years and have developed a range of quality membranes which will satisfy each of the defined market sectors.

In conjunction with our modular partners, roofing blankets are manufactured in offsite facilities. The membrane chosen by the client is heat welded to their required dimensions and shipped directly to their premises where it is attached to the modular roof structure, either using adhesive or mechanically fixing prior to being transported to its ultimate destination. Should the project consist of a number of separate modules that need to be connected on site, there are accessories such as tapes and membrane straps available in the range to enable the contractor to make a waterproof connection.



Modular membrane product range

The Fatra range of modular PVC membranes consists of the following membranes:

- Temporary membrane: **Stafol PVC unreinforced membrane**
- Mid-term membrane: **FF810V 0.89 PVC reinforced membrane**
- Long-term membrane: **Ekoplan PVC reinforced membrane**

Temporary membrane standard characteristics

Stafol PVC membrane	
Reference	Stafol
Roll width	1,400mm
Roll length	200m
Thickness	0.5mm
Area	280m²
Colour	Light grey
Guarantee	10 years

Stafol is a high performance, 0.5mm thick, unreinforced PVC membrane designed for use as a short-term waterproofing solution, or for use on roofs which will have other buildings or cabins stacked above them. Stafol carries a 10 year warranty.



Mid-term membrane standard characteristics

FF810V 0.89 PVC membrane	
Reference	FF810V 0.89
Roll width	1,690mm
Roll length	40m
Thickness	0.89mm
Area	67.6m²
Colour	Dark grey
Guarantee	12 years

Fatra FF810V 0.89 is a high performance, 0.89mm thick reinforced PVC membrane designed for roofs that require a warranty of 12 years.

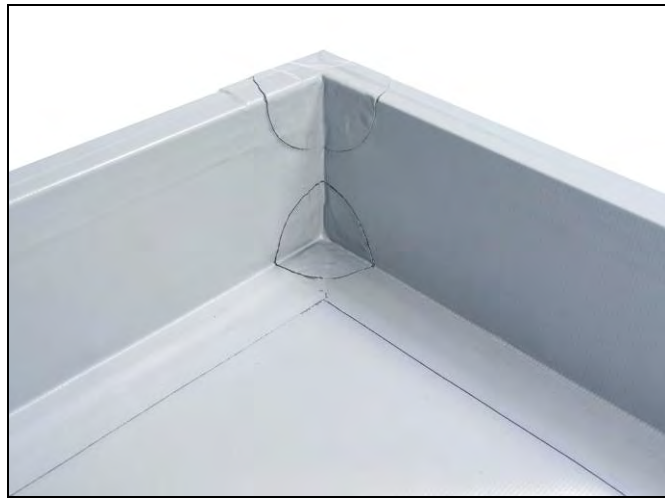
Long-term membrane standard characteristics

Ekoplan PVC membrane	
Reference	Ekoplan
Roll width	2m
Roll length	100m
Thickness	1.2mm
Area	200m²
Colour	Light grey
Guarantee	20 years

Ekoplan, part of the FF810 family of membranes, is a robust and durable 1.2mm thick PVC membrane that contains a polyester grid reinforcement. The membrane contains a 50% recycled content making it one of the most eco-friendly membranes available. Ekoplan carries a 20 year warranty.

Accessories

A range of useful tools, adhesives and accessories are available to complete the portfolio including pre-formed internal and external PVC corners, self-adhesive tape, pre-cut butt straps and pre-fabricated membrane coated metal angles.



The whole range has been designed and produced specifically for the modular building industry, encompassing the traditional installation methods but adding new value engineered solutions and techniques to enable membrane roofs to be installed more efficiently and with consistently reliable quality products.



Field Technicians & Training

Fatra Field Technicians are on hand to train installers on the correct use of heat guns and to help raise the skill levels of installers.



Whilst we understand the need for traditional upstand installation techniques to continue, we are able to offer alternative methods where longer term waterproofing is required as shown below.



The above picture illustrates the use of membrane coated metal angles (to which the membrane can be easily welded), pre-formed corners, fixings and flashing membrane. All of these items are available from Fatra.

Perimeter membrane coated metal trims are a quick and cost effective way of completing the installation, in addition to providing an additional means of restraint for the membrane for resulting in a securely fixed membrane.

Environmental Information

BRE Environmental Profiles Scheme

The BRE Environmental Profiles Scheme measures the environmental performance of materials and products over their entire lifecycle through their extraction, processing, construction, use and maintenance, and their eventual demolition and disposal. These assessments provide information on key issues of environmental sustainability such as climate change, acidification, consumption of minerals and water, emissions and pollutants to water and air.

The BRE established this scheme to provide an on-going, independent assessment of construction products, with the aim of clarifying any confusion about green credentials.

Fatra have had a number of complete roof build-ups independently tested and assessed by the BRE achieving an 'A+' BREEAM rating. Fatra are also the first PVC membrane manufacturer to obtain a set of Eco-point ratings from the BRE.

This information can then be used in BREEAM (Building Research Establishment Environmental Assessment Method) and other similar systems to assess and reduce the environmental impact of the building.



Our factory in the Czech Republic has also invested €30M in a factory based recycling plant. Recent advances have meant that Fatra are now able to include up to 50% recycle in new roofing membranes.

International Standards Organisation (ISO)

ISO 9001 Quality Management & ISO 14001 Environmental Management

The ISO is the world's most recognised quality management system standard. This certification represents assurance by an independent accredited body of conformity to specific requirements. It covers products and their components, services, people and systems.

The certification process typically includes on-site audits and standardised testing and inspections. Once a certificate has been delivered, it is maintained through regular audits. Fatra's ISO systems have been certified by Bureau Veritas, an international leader in certification of Quality, Health & Safety and Environmental management systems.



Fatra is committed to quality management and attained ISO 9001 Certification (Quality management) in 1994, not only for the design and manufacture of membranes but also for the design and manufacture of raw PVC products.

In 2000, Fatra added to this by attaining ISO 14001 Certification (Environmental management), again for the design and manufacture of both membranes and raw PVC. Together, these approvals give the designer and client assurance that Fatra manufacture sustainable, reliable, quality products with minimal environmental impact.



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Fatra Modular Membranes

2) Modular Membranes Datasheets

Fatra Stafol PVC membrane

Product Description

Fatra Stafol is a high performance, 0.5mm thick, unreinforced PVC membrane designed for use as a short term-waterproofing solution or for use on roofs which will have other buildings stacked above them.

Fatra Stafol is produced by calendering and lamination, in accordance with the standard BS EN 13967:2012 Flexible sheets for waterproofing

Guarantee

Stafol carries a 10 year warranty.

Typical Characteristics

Stafol PVC membrane	
Reference	Stafol
Roll width	1,400mm
Roll length	200m
Thickness	0.5mm
Area	280m²
Colour	Light grey
Guarantee	10 years

Packing, Transport & Storage

Stafol membrane is delivered to site in polyethylene-wrapped rolls, each clearly labelled with product and manufacturer details. Stafol membrane must be kept covered during transportation and stored in its original sealed packaging. The recommended storage temperature is from -5°C to +30°C. The rolls should be stored horizontally on a clean, dry & level surface and kept under cover until required.

Technical Characteristics

Stafol PVC membrane		
Characteristic	Test Standard	Value
Visible Defects	EN 1850-2	Meets
Straightness	EN 1848-2	Meets
Water tightness to 400 kPa	EN 1928 Method B	Meets
Resistance to static load	EN 12730 Method B	Meets 20 kg
Tensile strength	EN 12311-2 Method A	≥ 250 N/50 mm
Elongation at break		≥ 200 %
Durability of watertightnes against artificial ageing	EN 1296	Meets
	EN 1928	
Durability of watertightness against chemicals (Ca(OH) ₂ ; 10% NaCl)	EN 1847	Meets
	EN 1928	
Impact resistance	EN 12691 Method A	Meets 400 mm
	EN 12691 Method B	Meets 1000 mm
Tear resistance	EN 12310-1	≥ 50 N
Reaction to fire	EN 13501-1	Class E
Joint strength	EN 12317-2	≥ 250 N/50 mm
Water vapour properties, factor μ	EN 1931	17500 ± 2000
Mass per unit area, informative value	EN 1849-2	0.66 kg/m ²

Health & Safety

Stafol does not constitute a hazard under the COSHH Regulations under normal conditions of use.

Waste Disposal

Stafol can be disposed of in accordance with local regulations. The clean waste material can be recycled. Any contaminated waste must be disposed of in accordance with local regulations.

Related Documents

- *Construction and technologic regulation of waterproofing system FATRAFOL-H*
- *Manufacturing control system certificate No. 390-CPD-0022/06/Z of waterproofing membrane STAFOL 914, EKOPLAST 806, AQUAPLAST 805, FATRAFOL 803 according to Standard ČSN EN 13967:2005, emitted by CSI, a. s., Prague, workstation Zlín*
- *Installation Manual of Roofing Waterproofing System FATRAFOL-S*
- *Certificate EN ISO 9001 and EN ISO 14001 No. PRA 0003830, by LRQA*

Fatra FF810V 0.89 PVC membrane

Product Description

FF810V 0.89 is a high performance, 0.89mm thick, reinforced PVC membrane designed specifically for use as a waterproofing membrane on modular buildings. FF810V 0.89 can be fully adhered using Ultrabond Eco VS90 Plus.

FF810V 0.89 is supplied in pre-fabricated sheets which are hot air welded together to meet the client's requirements.

Guarantee

FF810V 0.89 membrane carries a 12 year warranty.

Typical Characteristics

FF810V 0.89 PVC membrane	
Reference	FF810V 0.89
Roll width	1,690mm
Roll length	40m
Thickness	0.89mm
Area	67.6m ²
Colour	Dark grey
Guarantee	12 years

Packing, Transport & Storage

FF810V 0.89 membrane is delivered to site in polyethylene-wrapped rolls, each clearly labelled with product and manufacturer details. FF810V 0.89 membrane must be kept covered during transportation and stored in its original sealed packaging. The recommended storage temperature is from -5°C to +30°C. The rolls should be stored horizontally on a clean, dry & level surface and kept under cover until required.

Health & Safety

FF810V 0.89 PVC membrane does not constitute a hazard under the COSHH Regulations under normal conditions of use.

Waste Disposal

FF810V 0.89 PVC membrane can be disposed of in accordance with local regulations. The clean waste material can be recycled. Any contaminated waste must be disposed of in accordance with local regulations.

Related documentation

- *Construction and technologic regulation of roofing waterproofing system FATRAFOL-S (PN 5415/2011)*
- *Manufacturing control system certificate No. 1390-CPD-0161/11/Z of waterproofing membrane EKOPLAN 819/V according to Standard ČSN EN 13956:2006/AC:2006, emitted by CSI, a. s., Prague, workstation Zlín*
- *Installation Manual of Roofing Waterproofing System FATRAFOL-S*
- *Certificate EN ISO 9001 and EN ISO 14001 No. PRA 0003830, by LRQA*

Fatra Ekoplan Reinforced PVC Membrane

Product Description

Fatra Ekoplan Reinforced PVC membrane, part of the FF810 family of membranes, is a robust and durable 1.2mm thick PVC membrane that contains a polyester grid reinforcement. Fatra Ekoplan membrane is produced by a multi-extrusion process and contains 50% recycled content making it one of the most eco-friendly membranes available.

Fatra Ekoplan membrane is also resistant to UV radiation and can be left exposed to weathering influences.

Guarantee

Fatra Ekoplan membrane carries a 20 year warranty.

Typical Characteristics

Ekoplan PVC membrane	
Reference	Ekoplan
Roll width	2m
Roll length	100m
Thickness	1.2mm
Area	200m ²
Colour	Light grey
Guarantee	20 years

Packing, Transport & Storage

Fatra Ekoplan membrane is delivered to site in polyethylene-wrapped rolls, each clearly labelled with product and manufacturer details. Fatra Ekoplan membrane must be kept covered during transportation and stored in its original sealed packaging. The recommended storage temperature is from -5°C to +30°C. The rolls should be stored horizontally on a clean, dry & level surface and kept under cover until required.

Technical Characteristics

Ekoplan PVC membrane			
Characteristic		Test Standard	Value
Visible Defects		EN 1850-2	Meets
Straightness		EN 1848-2	≤ 50 mm
Flatness		EN 1848-2	≤ 10 mm
Dimensional stability		EN 1107-2	Max. ± 0.5 %
Maximum tensile force	MD	EN 12311-2 Method A	≥ 1000 N/50 mm
	CD		≥ 1000 N/50 mm
Elongation at maximum tensile force	MD		≥ 15 %
	CD		≥ 15 %
Tear resistance	MD	EN 12310-2	≥ 180 N
	CD		≥ 180 N
Foldability at low temperature		EN 495-5	≤ -10 °C
Joint peel resistance	MD	EN 12316-2	≥ 200 N/50 mm
	CD		≥ 200 N/50 mm
Joint shear resistance	MD	EN 12317-2	≥ 800 N/50 mm
	CD		≥ 800 N/50 mm
Water tightness 400 kPa		EN 1928 Method B	Meets
Resistance to static load		EN 12730 Method B	Meets 20 kg
Reaction to fire		EN 13501-1	Class E
Impact resistance		EN 12691 Method A	Meets 1000 mm
		EN 12691 Method B	Meets 1500 mm
Exposure to UV radiation, elevated temperature and water		EN 1297	Meets, grade 0
Water vapour properties, factor μ		EN 1931	15000 ± 5000

MD: Machine Direction, CD: Cross Direction

Health & Safety

Ekoplan membrane does not constitute a hazard under the COSHH Regulations under normal conditions of use.

Waste Disposal

Ekoplan membrane can be disposed of in accordance with local regulations. The clean waste material can be recycled. Any contaminated waste must be disposed of in accordance with local regulations.

Related documentation

- *Construction and technologic regulation of roofing waterproofing system FATRAFOL-S (PN 5415/2011)*
- *Manufacturing control system certificate No. 1390-CPD-0161/11/Z of waterproofing membrane EKOPLAN 819/V according to Standard ČSN EN 13956:2006/AC:2006, emitted by CSI, a. s., Prague, workstation Zlín*
- *Installation Manual of Roofing Waterproofing System FATRAFOL-S*
- *Certificate EN ISO 9001 and EN ISO 14001 No. PRA 0003830, by LRQA*

Roofbond Waterproof Sealing Tape

Product Description

Roofbond Waterproof Sealing Tape is a modified synthetic rubber, self-adhesive tape, laminated with a UV stable aluminium / polyester reinforced backing. The adhesive surface is protected by a siliconised liner.

- Immediate, permanent & guaranteed seal for all surfaces
- No primer required
- Rapid installation reduces labour time
- Eliminates risk of fire
- Eliminates cracked seams under thermal shock
- 10 year warranty



Applications

Roofbond Waterproof Sealing Tape is primarily used to seal junctions and perimeters in conjunction with Fatra's range of modular PVC membranes. The tape can also be used as a membrane day joint, and for the waterproofing of all joints and seams found on building & roofing surfaces including but not limited to PVC, EPDM, TPO, bitumen, concrete, tile, brick, metal, glass & wood.

Standard Characteristics

Roofbond Waterproof Sealing Tape	
Standard colours	Black / White / Grey
Standard sizes	150mm x 10m, 200mm x 10mm
Thickness	1mm

Physical Properties

Roofbond Waterproof Sealing Tape		
Properties	Tests	Results
Pull Force	MEL052	>10 N/cm
Permeability to vapour	NF T 30-018	< 1 g/m ² /24 h
Resistance to sag at 70°C	ISO 7390	< 3mm
Resistance to tear	NF T 54-108	≈ 3 N
Service Temperature		-30°C to +80°C
Application temperature		+5°C to +40°C
Resistance to UV		Excellent
Fire classification	E, EN ISO 11925-2 & EN 13501-1	

Certifications

Roofbond Waterproof Sealing Tape		
Manufacturing plant	ISO EN 9001	TÜV Certification
Resistance to sag	ISO 7390	TÜV Certification
Pull Force	MEL052	TÜV DIN51 1485
Permeability to vapour	NF T 30- 018	NF EN Certification
Resistance to tear	NF T 54-108	NF EN Certification
Flexible Sheets for Waterproofing		DIN EN 13956

Surface Preparation

The surface must be clean, dry and free of dust & rust.

Remove any grease with a solvent or Fatra FF860 Solvent Cleaner.

Installation

Remove the protective liner and install the tape.

Apply pressure with a silicone seam roller to activate the adhesion process and to remove entrapped air.

Shelf Life

24 months from production date in original unopened packaging.

Store in a non-humid, well ventilated storage area at a maximum temperature of 30°C

Product Warranty:

10 years (Product replacement)

Note: The technical advice provided and values indicated are given to the best of our knowledge and designed for achieving the maximum potential from our products. It is up to the user to test the product for material compatibility, respect local legislation and obtain the necessary authorisations for use of the product.

Ultrabond Eco VS90 Plus Adhesive

Product Description

Ultrabond Eco VS90 Plus is a solvent-free, acrylic water based adhesive, suitable for bonding Fatra's range of modular PVC membranes to a wide range of substrates. Ultrabond Eco VS90 Plus is packaged in 16kg tins and is supplied as a ready to use, light beige paste.

Characterised by a fast and strong initial grab and a rapid set, the product cures to give a highly shear resistant adhesive with excellent peel strength. Due to its solvent free properties, the adhesive can be used indoors as part of Fatra's range of modular PVC membranes

Product Properties

- Easy application
- Little to no waiting time
- Excellent wetting even with difficult covering
- Rapid set development
- Very good peel strength
- High shear resistance
- Very good dimensional stability
- Prevents open joints
- Solvent free
- Non-flammable
- EMICODE EC1 Plus (Very low emission)
- Harmless to the health of the installer / end-user

Application Examples

Although primarily intended for bonding Fatra's range of modular PVC membranes, Ultrabond Eco VS90 Plus can be used for adhering:

- Sheet or tile rubber flooring with smooth or textured surfaces
- Homogeneous and heterogeneous PVC floor coverings, sheets and tiles
- PCV and multilayer PVC floor coverings
- Vinyl Tiles
- Textile floor coverings with a suitable backing
- Needle-punch woven flooring
- Polyurethane, polyolefin and synthetic backed linoleum flooring
- PUR floor coverings
- PVC and rubber wall coverings

Packaging

Ultrabond Eco VS90 Plus is available in 16 kg drums

Coverage rate

Consumption rates will vary according to the substrate condition, type and the ambient temperature. A 16 kg tin will cover approximately 50 m² based on a consumption rate of 300 g/m².

Technical Data

Ultrabond Eco VS90 Plus Adhesive	
Product Characteristics	
Consistency	Creamy paste
Colour	Light beige
Density (g/cm ³)	1.25
pH	8
EMICODE	EC1 Plus: very low emission
Blauer Engel	RAL-UZ 113 For further information please refer to the MSDS
Application Data	
Application temperature range	From +15°C to +35°C
Waiting time	0 to 10 minutes
Open time	20 to 30 minutes
Light foot traffic	3 to 5 hours
Ready for use	24 to 48 hours
Final Performance Data	
Peel 90° adhesion test to EN 1372 (N/mm): <ul style="list-style-type: none"> • Homogeneous PVC • Heterogeneous PVC • smooth rubber • Linoleum 	In compliance with EN 14259

Recommendations

Install in recommended temperatures, normally between +15°C and +35°C.

Do not install on damp substrates.

Application Procedure

Preparing the substrate

Substrates must be dry, absorbent, level, sound, mechanically strong, and free from dust, loose particles, cracks, paints, wax, oil, rust, traces of gypsum or other products that can interfere with bonding. Commonly, the moisture content must be a maximum 2% to 2.5% for cementitious substrates and a maximum 0.5% for gypsum based substrates.

Acclimatisation

Before starting the installation, make sure that the membranes or wall covering and the substrate are acclimatised to the recommended temperatures and relative humidity.

Applying the Adhesive

Ultrabond Eco VS90 Plus is ready to use and does not need any preparation. Before applying, stir the adhesive in the bucket. Apply the adhesive evenly to the substrate with a suitable notched trowel.

Installing Fatra Modular Membranes

Leave a waiting time according to the application quantity, climatic conditions, substrate absorbency and type of covering. Only apply as much adhesive as can be covered within the open time and with good transfer to the backing of the covering. Lay the membrane whilst still wet: the adhesive ridges has to be impressed. Take care to avoid air pockets and carefully rub the floor covering down to ensure good adhesive transfer to the backing.

Avoid excessive stress at the seams. After laying the membrane, apply pressure using a roller or a soft brush.

Note: *Open time may vary depending on temperature, relative humidity and absorbency of the substrate. It will be shorter at higher temperatures and lower humidity, but longer at lower temperatures, higher humidity and with low absorbent substrates.*

Cleaning

While still wet, Ultrabond Eco VS90 Plus can be cleaned from floor coverings, tools, hands and clothing with water. When dry, clean with alcohol or a suitable solvents.

Storage

Under normal conditions, Ultrabond Eco VS90 Plus is stable for at least 12 months in its original sealed packaging. Protect from frost.

Safety Instructions for Preparation and Application

Ultrabond Eco VS90 Plus is not considered dangerous according to the current regulation regarding the classification of mixtures. It is recommended to wear protective gloves and goggles and to take the usual precautions for handling chemicals. For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.

Keep out of reach of children. Ensure good ventilation during and after application and drying. Avoid eating, drinking or smoking while processing this product. In case of contact with eyes or skin rinse immediately with plenty of water. Do not allow product to reach sewage system or any water course. Do not allow to penetrate the ground / soil.

Clean tools with soap and water immediately after use. Only properly emptied containers may be recycled. Dried product residues can be disposed of as normal household waste.

Product contains: MIT / BIT (1:1) and CIT/MIT (3:1).

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Fatra Modular Membranes

3) Modular Membranes Standard Details

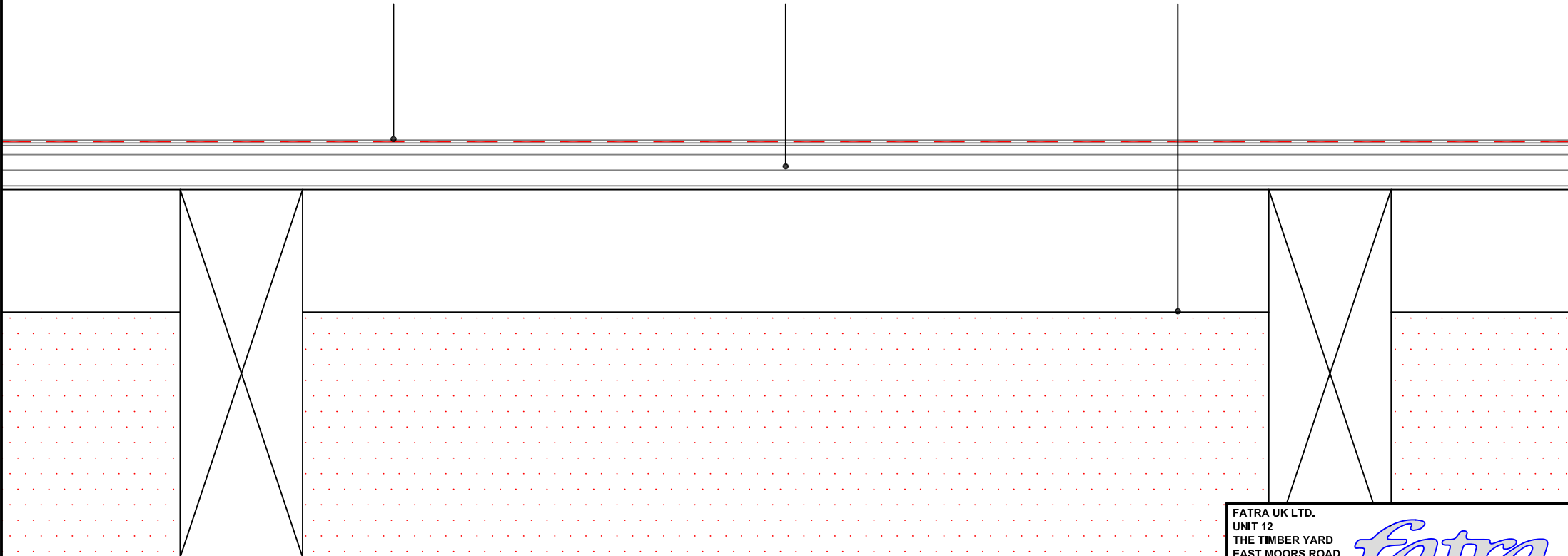
Modular Membrane Detailing

Section through deck

Fatra membrane

Plywood or OSB deck

Insulation



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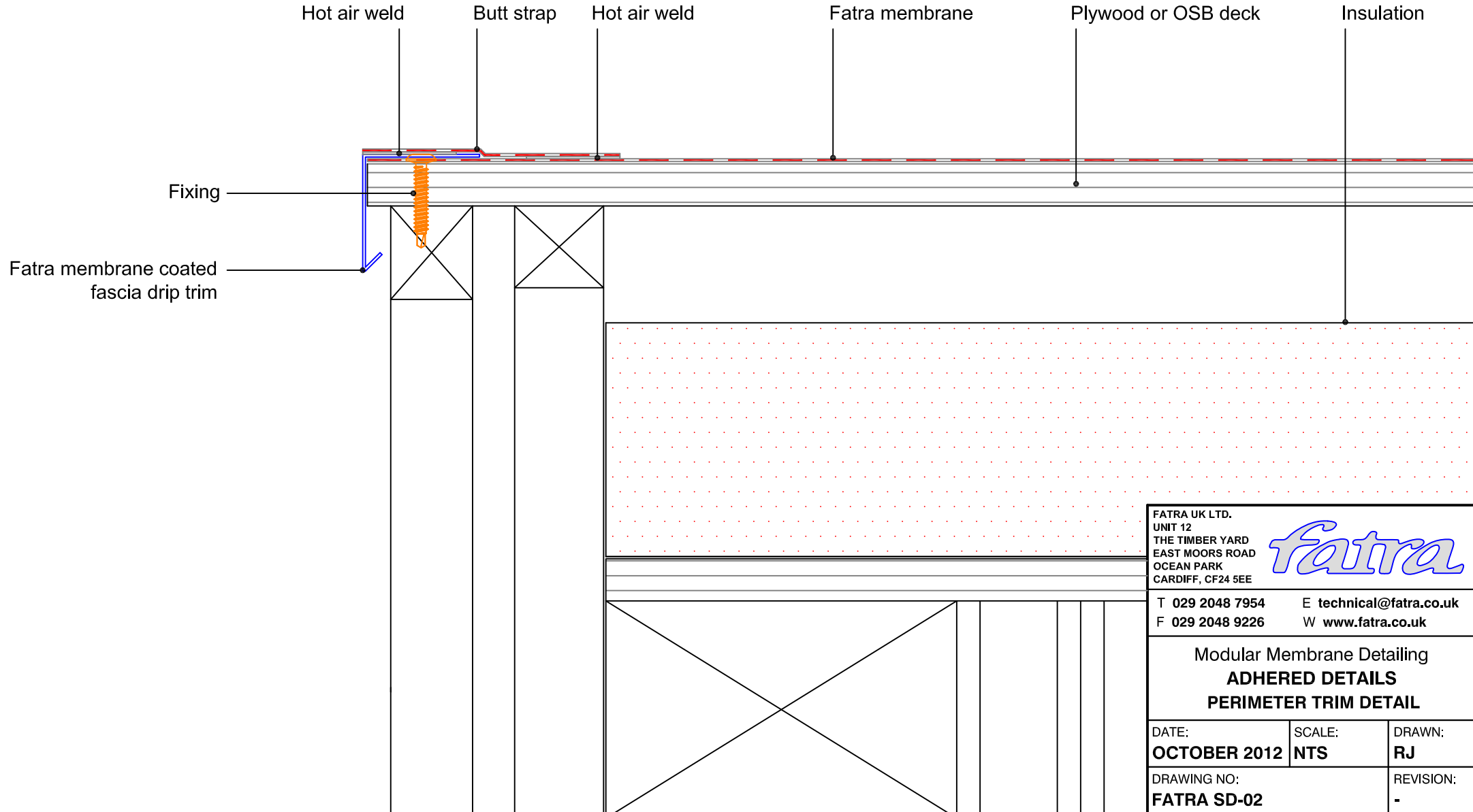
Modular Membrane Detailing
ADHERED DETAILS
SECTION THROUGH PLYWOOD DECK

DATE: OCTOBER 2012	SCALE: NTS	DRAWN: RJ
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DRAWING NO: FATRA SD-01	REVISION: -
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Modular Membrane Detailing

Perimeter Trim Detail



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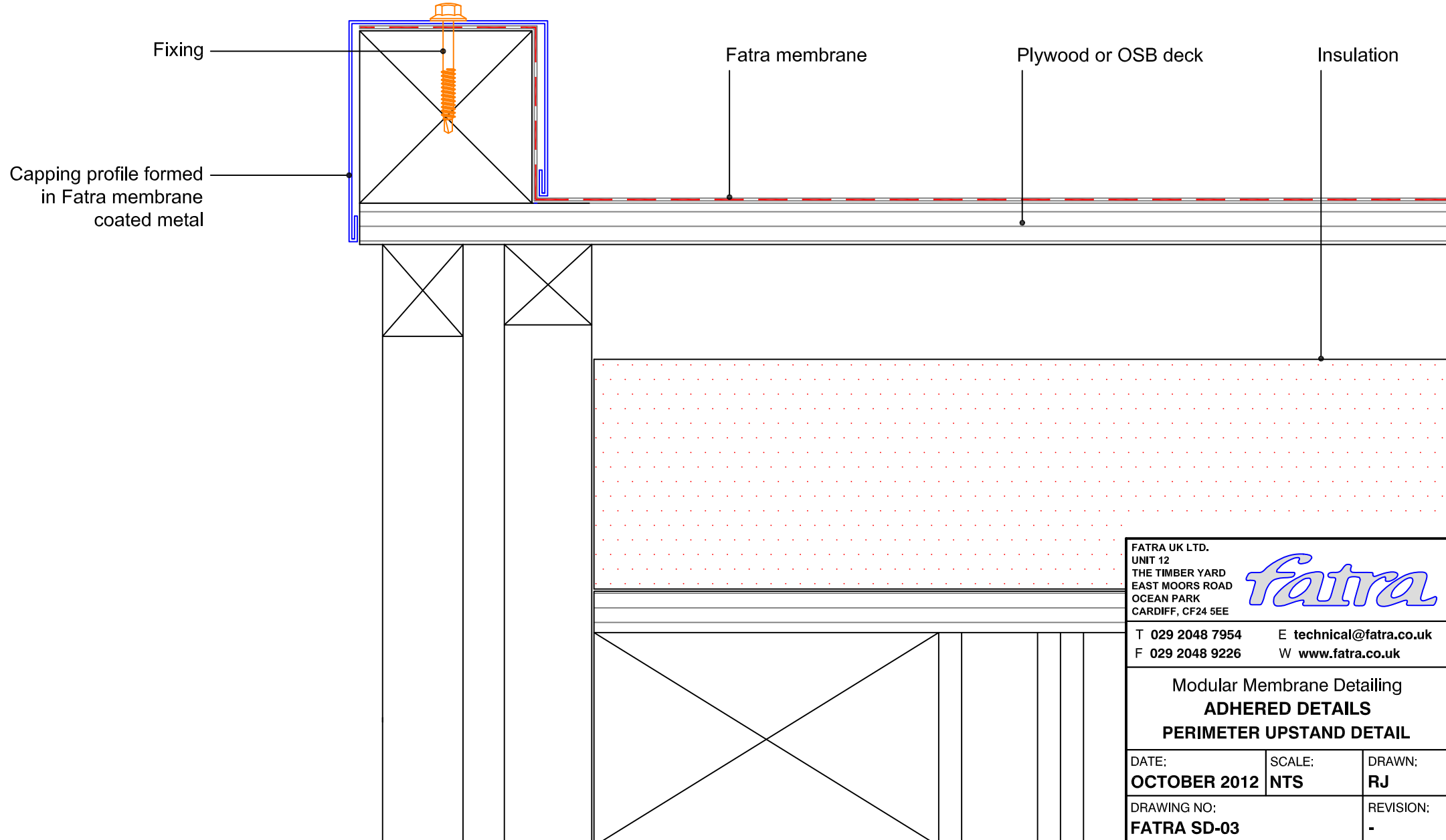
Modular Membrane Detailing
ADHERED DETAILS
PERIMETER TRIM DETAIL

DATE: OCTOBER 2012	SCALE: NTS	DRAWN: RJ
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Modular Membrane Detailing

Perimeter Upstand Detail



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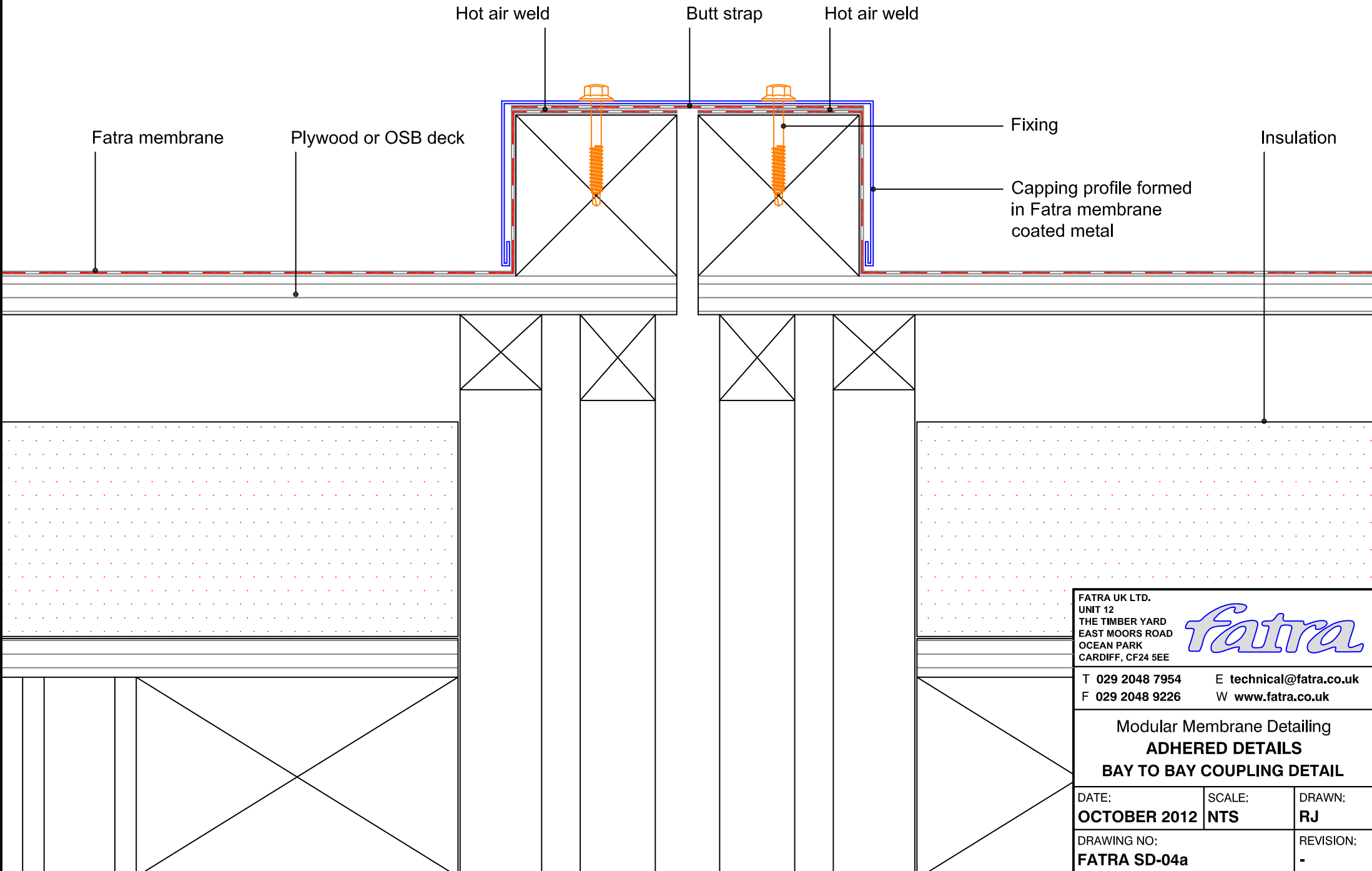
Modular Membrane Detailing
ADHERED DETAILS
PERIMETER UPSTAND DETAIL

DATE: OCTOBER 2012	SCALE: NTS	DRAWN: RJ
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DRAWING NO: FATRA SD-03	REVISION: -
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Modular Membrane Detailing

Bay to Bay Coupling Detail



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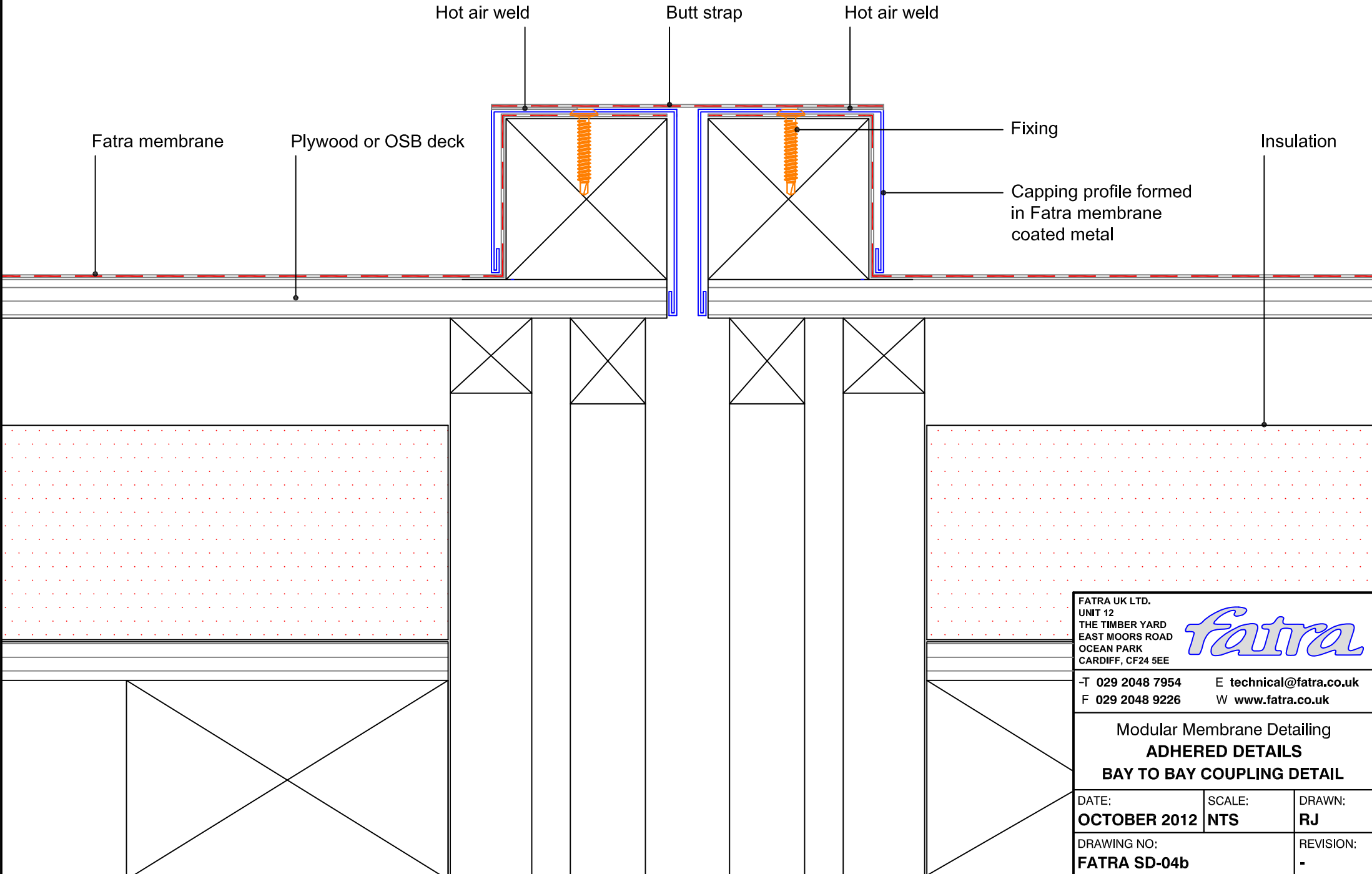
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Modular Membrane Detailing
ADHERED DETAILS
BAY TO BAY COUPLING DETAIL

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DRAWING NO: FATRA SD-04a		REVISION: -

Modular Membrane Detailing

Bay to Bay Coupling Detail



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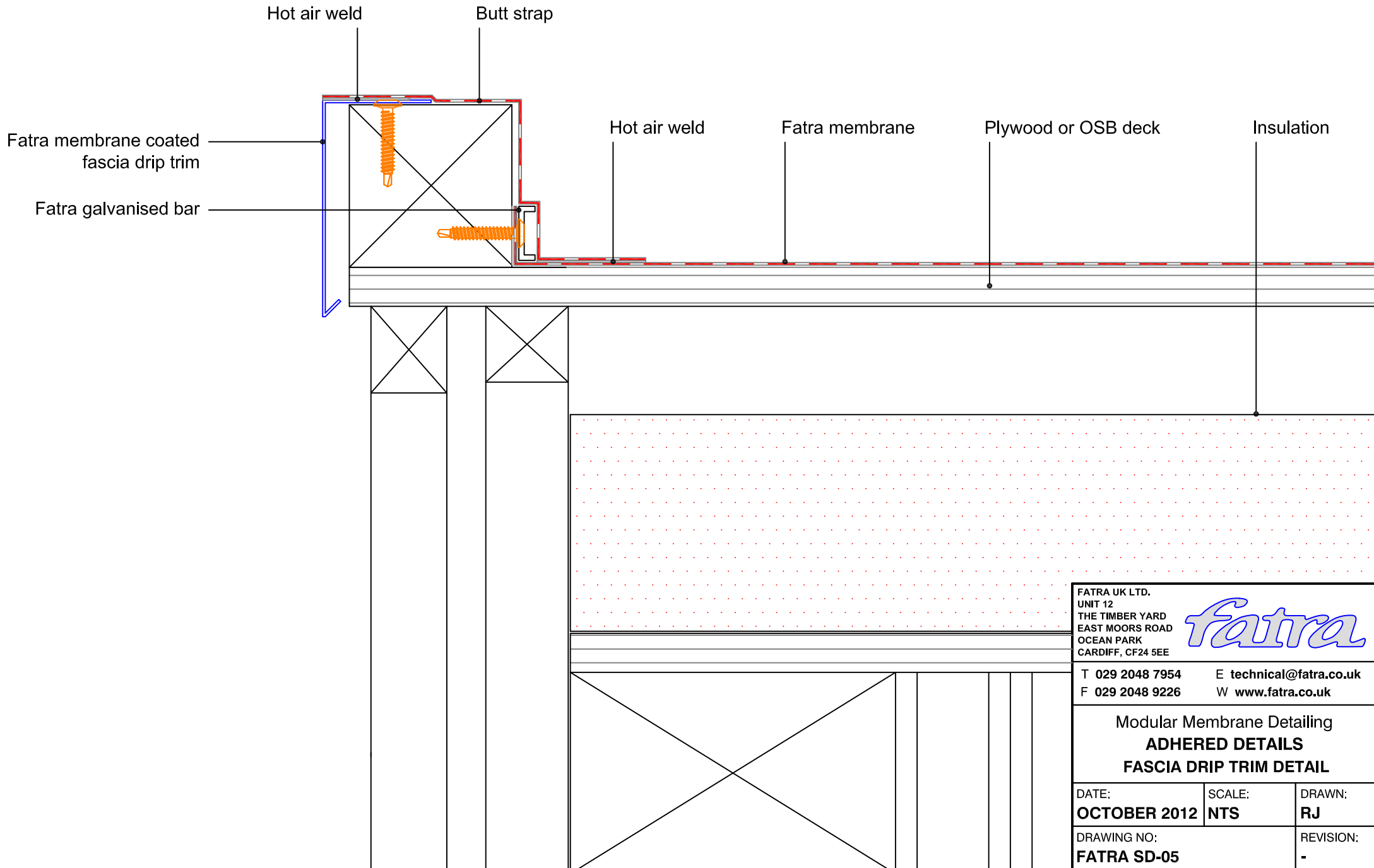
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Modular Membrane Detailing
ADHERED DETAILS
BAY TO BAY COUPLING DETAIL

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Modular Membrane Detailing

Perimeter Upstand Detail with bar



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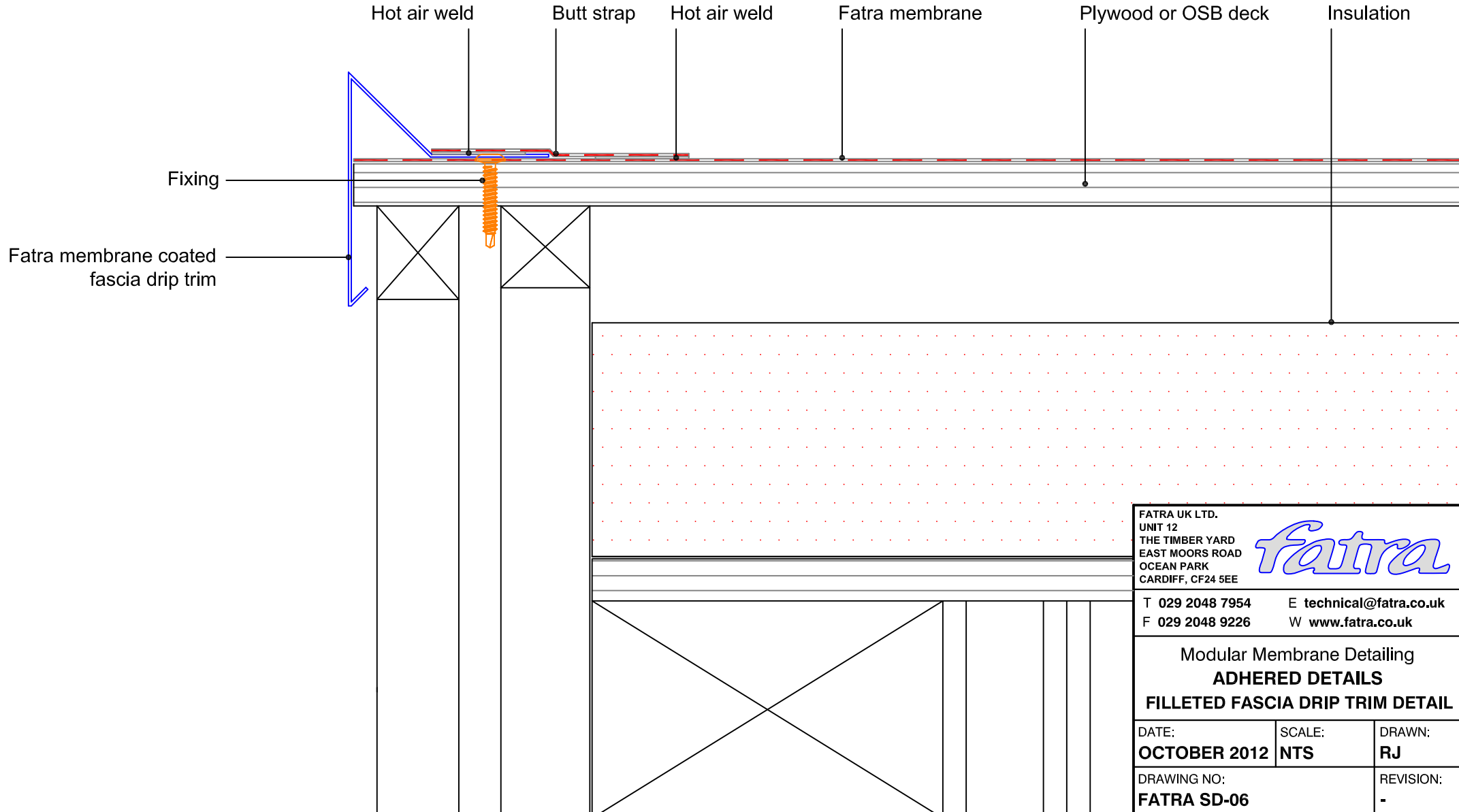
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Modular Membrane Detailing
ADHERED DETAILS
FASCIA DRIP TRIM DETAIL

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DRAWING NO: FATRA SD-05		REVISION: -

Modular Membrane Detailing

Filletted Fascia Drip Trim Detail



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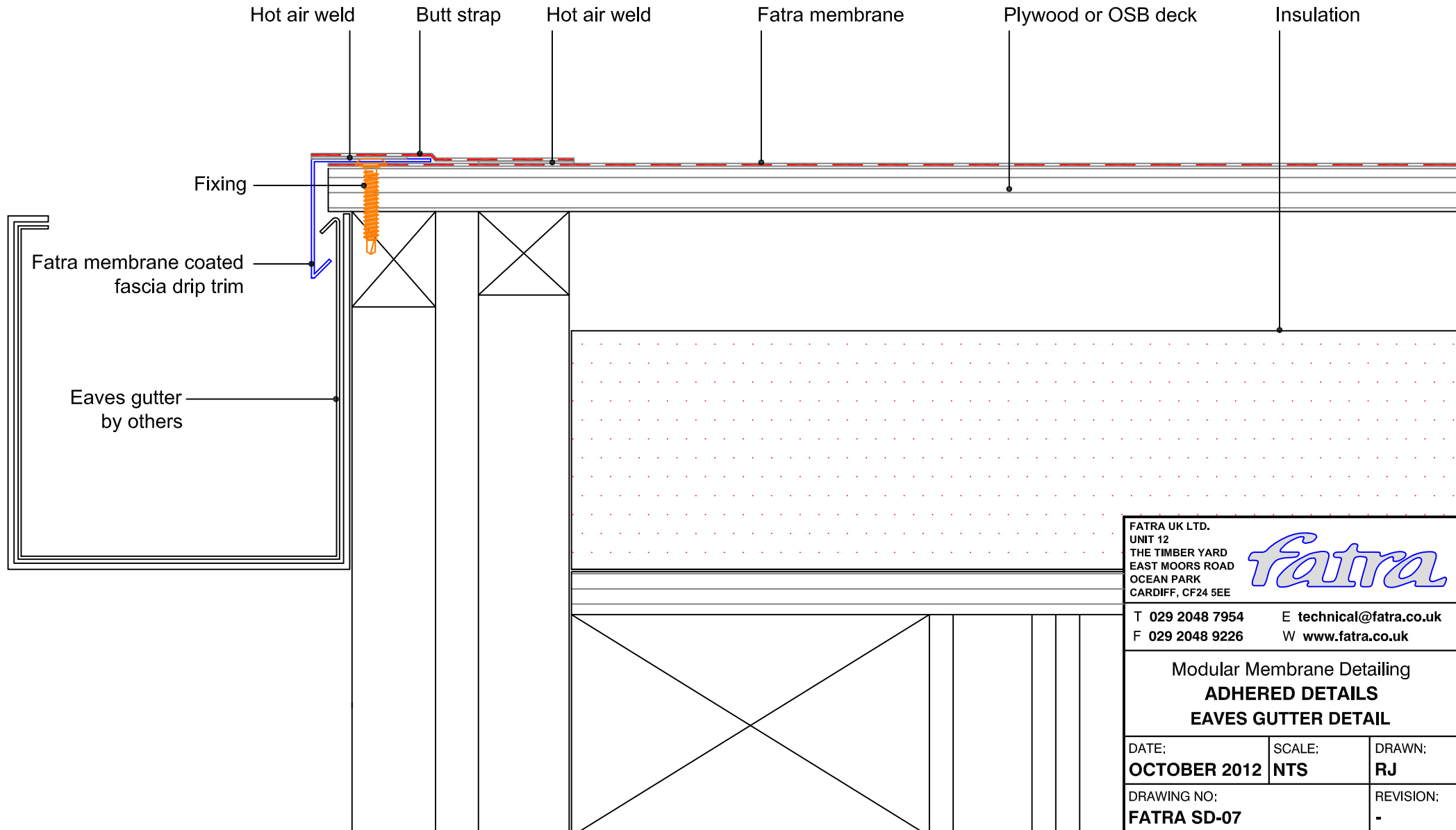
Modular Membrane Detailing
ADHERED DETAILS
FILLETED FASCIA DRIP TRIM DETAIL

DATE: OCTOBER 2012	SCALE: NTS	DRAWN: RJ
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Modular Membrane Detailing

Eaves Gutter Detail



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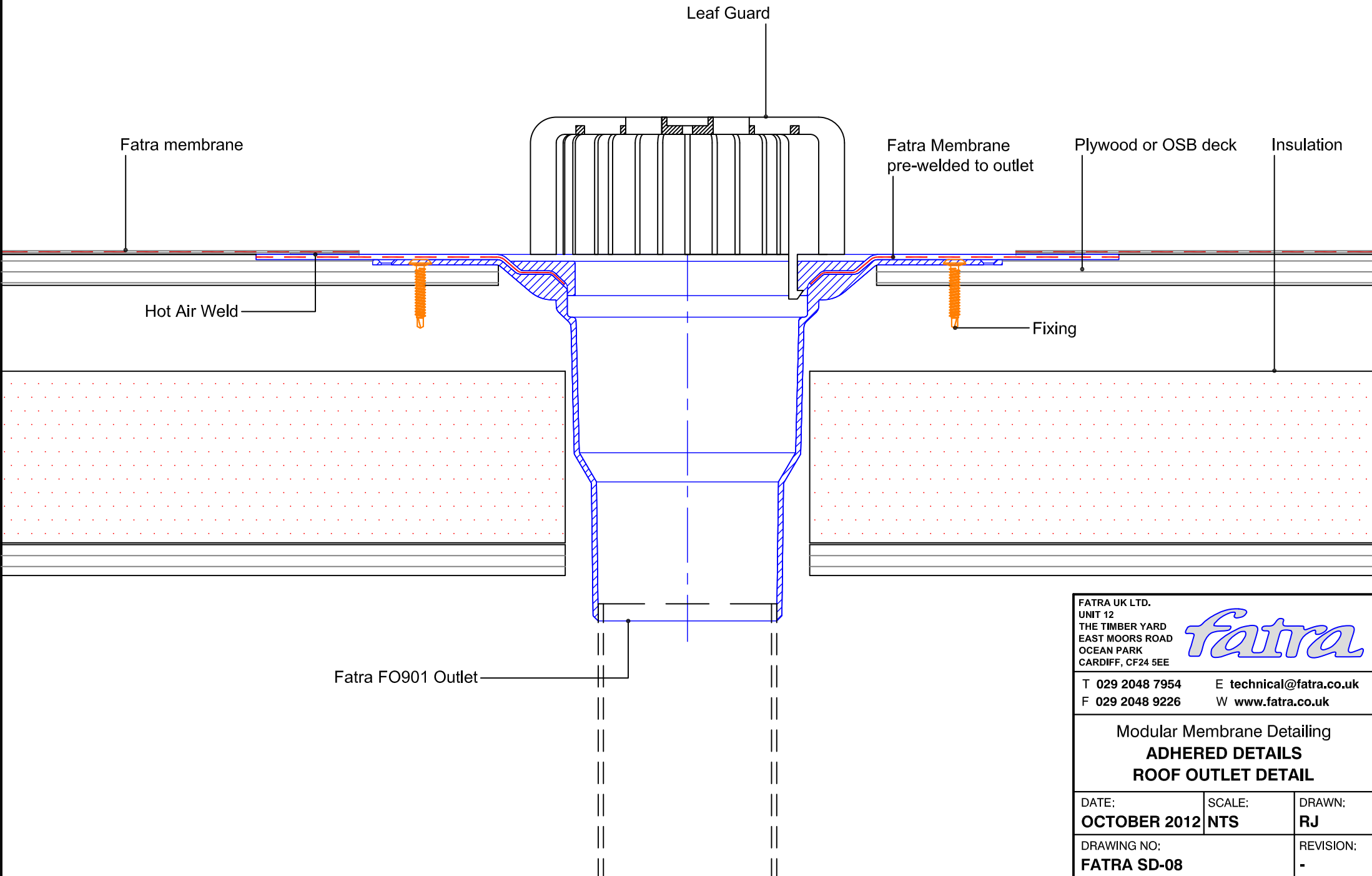
Modular Membrane Detailing
ADHERED DETAILS
EAVES GUTTER DETAIL

DATE: OCTOBER 2012	SCALE: NTS	DRAWN: RJ
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DRAWING NO: FATRA SD-07	REVISION: -
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Modular Membrane Detailing

Roof Outlet Detail



FATRA UK LTD.
 UNIT 12
 THE TIMBER YARD
 EAST MOORS ROAD
 OCEAN PARK
 CARDIFF, CF24 5EE



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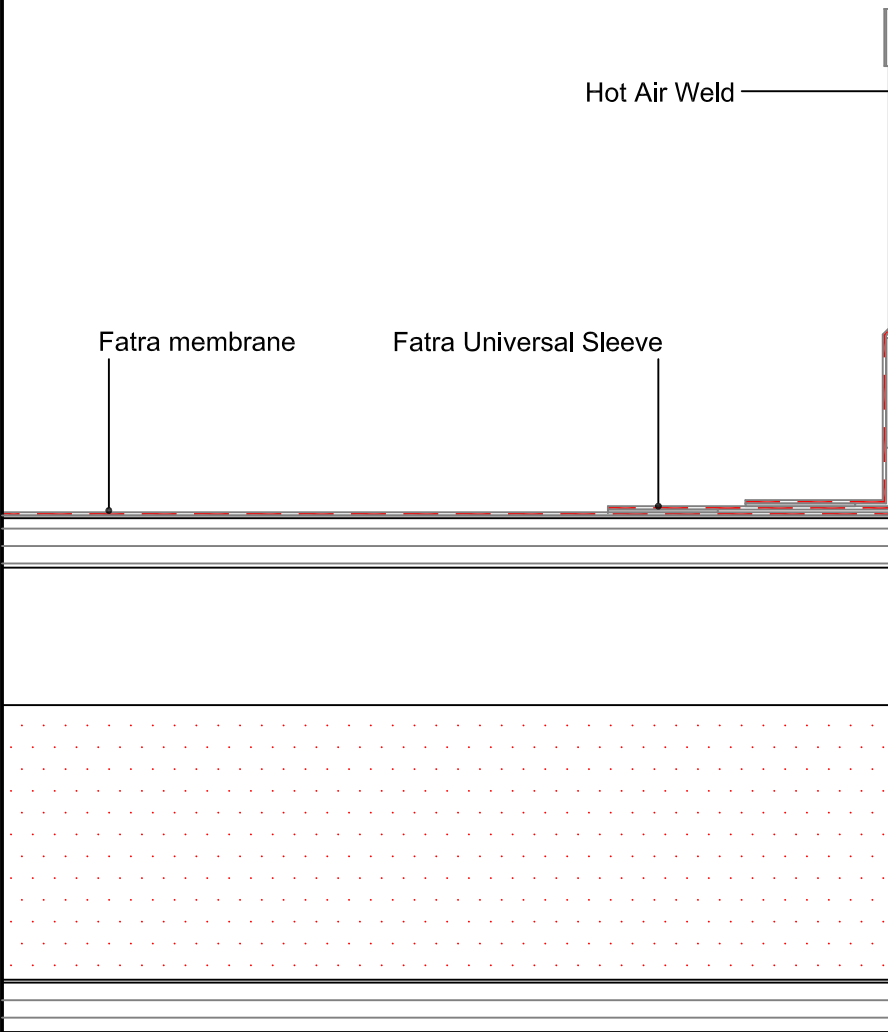
Modular Membrane Detailing
ADHERED DETAILS
ROOF OUTLET DETAIL

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DRAWING NO: FATRA SD-08	REVISION: -
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Modular Membrane Detailing

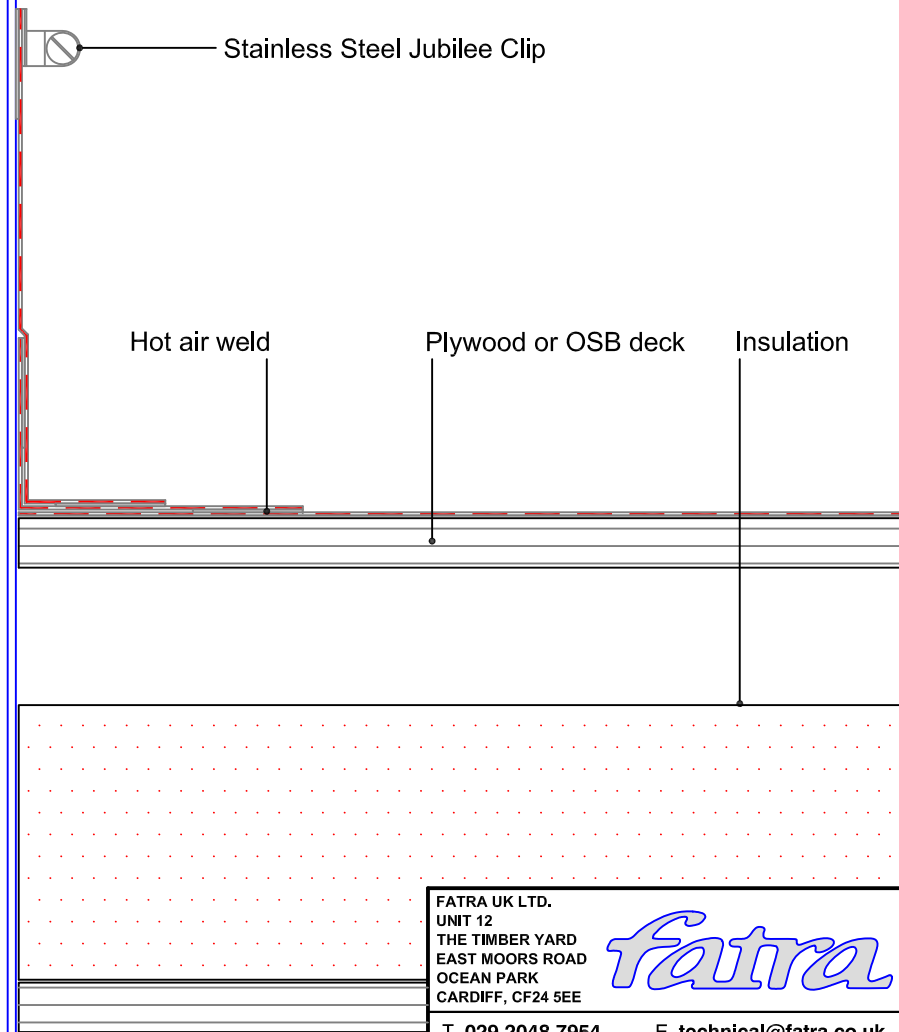
Pipe Penetration Detail



Fatra membrane

Fatra Universal Sleeve

Hot Air Weld



Stainless Steel Jubilee Clip

Hot air weld

Plywood or OSB deck

Insulation

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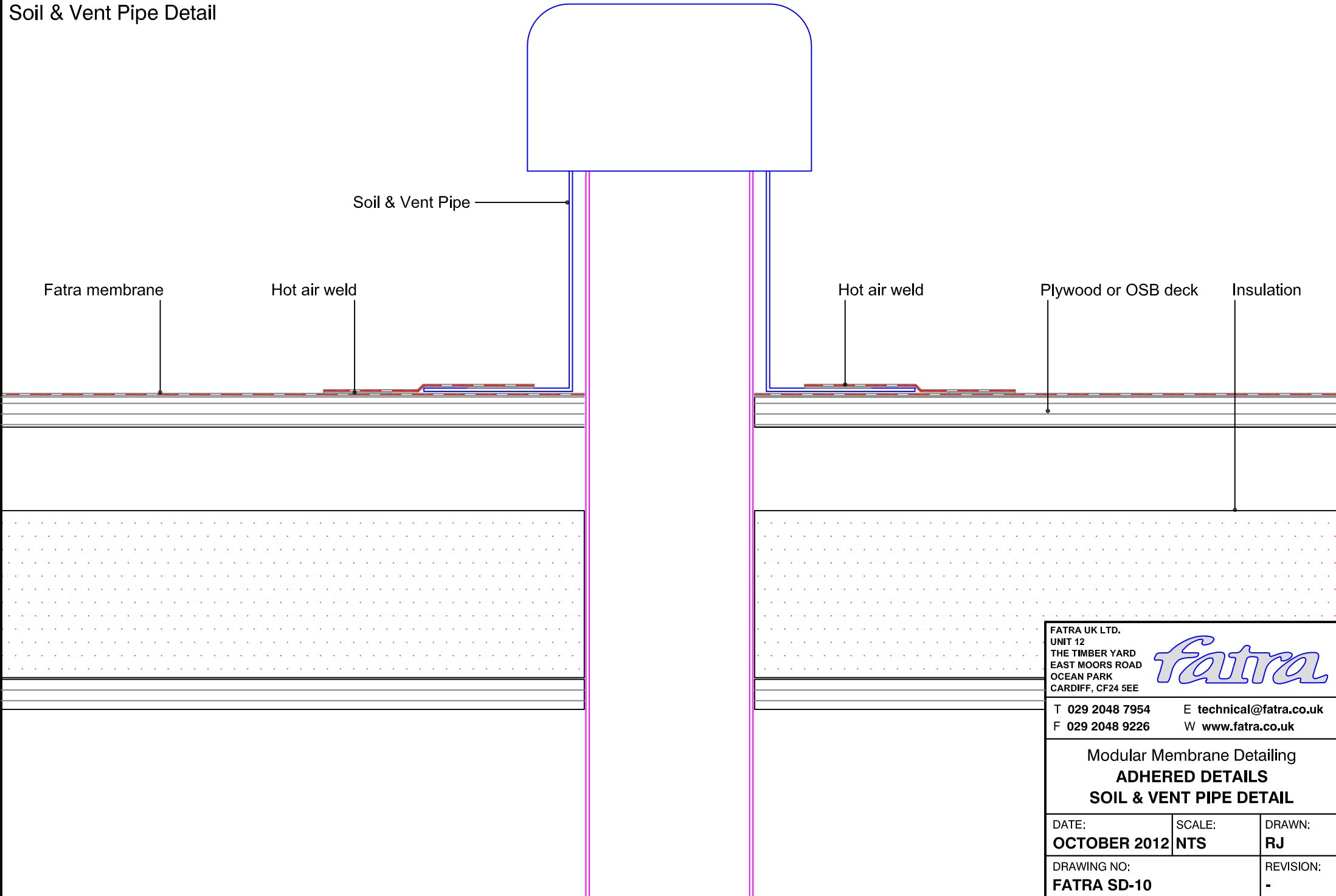
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Modular Membrane Detailing
ADHERED DETAILS
PIPE PENETRATION DETAIL

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Modular Membrane Detailing
Soil & Vent Pipe Detail



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Modular Membrane Detailing
ADHERED DETAILS
SOIL & VENT PIPE DETAIL

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DRAWING NO: FATRA SD-10		REVISION: -